6.11 Boreal Hardwood Forests

Populus tremuloides - Betula papyrifera / (Abies balsamea, Picea glauca) Forest (Aspen - Birch / Boreal Conifer Forest)

COMMON NAME	Trembling Aspen - Paper Birch / (Balsam Fir, White Spruce) Forest
SYNONYM	*Aspen - Birch / Boreal Conifer Forest*
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.B.2.N)
FORMATION	Montane or boreal cold-deciduous forest (I.B.2.N.b)
ALLIANCE	POPULUS TREMULOIDES - BETULA PAPYRIFERA FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL

USFWS WETLAND SYSTEM TERRESTRIAL

RANGE

Voyageurs National Park

This is one of the most abundant and widespread types in the Park and environs.

Globally

This community is found in Manitoba, Ontario, northern Minnesota, northern Wisconsin, and Michigan.

ENVIRONMENTAL DESCRIPTION

Voyageurs National Park

This type occurs in a wide variety of positions on the landscape from well drained ridges with shallow soils to moderately drained lower areas. Though they can occupy moderate (6-14 degree) slopes, they generally occur on flat to gently sloping terrain with variable aspects. Soils are very rocky loams or fine sandy loams ranging from 2-10 cm deep. The more mesic example of this type may occur over a clay subsoil. An abundance of coarse woody debris is common.

Globally

This community is found on a variety of topographic positions. Omann and Ream (1971) found it on ridgetops, upper, mid, and lower slopes. These slopes are gentle to moderate. The soils are deep, well drained to rapidly drained mineral soils (Sims *et al.* 1989). The soils are usually loam but can be clay, silt, or sand.

MOST ABUNDANT SPECIES

Voyageurs National Park

Stratum	Species
Tree canopy	*Populus tremuloides, Betula papyrifera, Populus grandidentata*
Tree sub-canopy	*Abies balsamea, Acer rubrum*
Tall shrub	*Abies balsamea, Acer rubrum, Corylus cornuta*
Short shrub	*Corylus cornuta, Populus tremuloides*
Forb	*Aster macrophyllus, Aralia nudicaulis*
Fern	*Pteridium aquilinum*

Globally

Stratum	Species
Tree canopy	*Populus tremuloides, Betula papyrifera*
Short shrub	*Abies balsamea, Picea glauca*
Forb	*Aster macrophyllus, Aralia nudicaulis*

CHARACTERISTIC SPECIES

Voyageurs National Park

Populus tremuloides, Betula papyrifera, Abies balsamea, Populus grandidentata

Globally

Populus tremuloides, Betula papyrifera, Abies balsamea

VEGETATION DESCRIPTION

Voyageurs National Park

This is one of the most variable types in the Park and environs. It includes fairly young forests, mostly outside the park, where the canopy is 5-10m tall, to the more mature stands, mostly within the park, where the canopy is 20-35m tall. Typically, the canopy is dominated by *Populus tremuloides, Betula papyrifera*, and/or *Populus grandidentata*, is 10-20m tall, and has a cover of 70-80%. The sub-canopy is usually absent, but if present, contains low cover (20-30%) and *Abies balsamea* or *Acer rubrum*. The tall shrub stratum, on the other hand, is nearly always present at around 30-40% cover. *Abies balsamea* is the most common species in the sub-canopy and tall shrub layers, though in rare situations *Acer rubrum* may be more abundant. The short shrub stratum very often contains *Corylus cornuta*, commonly around 30% cover, but reaching 90-100% cover in some circumstances. The cover of the herbaceous stratum is usually 70-90% and can in some circumstances be composed almost entirely of *Pteridium aquilinum, Aster macrophyllus,* and *Aralia nudicaulis*. In addition to these, the herbs *Cornus canadensis, Rubus pubescens, Clintonia borealis*, and *Maianthemum canadense* may also be present.

Globally

This community is dominated by deciduous trees, with a moderate amount of conifers (<25%). The dominant tree species do not have dense leaf layers and allow a significant amount of light to pass through. This promotes the establishment of prominent sapling and shrub layers and a moderately dense herbaceous stratum. The canopy is dominated by *Betula papyrifera* and *Populus tremuloides,* and occasionally *Populus grandidentata*. Conifer associates include *Abies balsamea* and *Picea glauca*, either in the canopy or, more characteristically, in the subcanopy. *Abies balsamea* and *Picea glauca* are abundant in the sapling layer. Common shrubs include *Acer spicatum, Corylus cornuta, Diervilla lonicera, Linnaea borealis, Lonicera canadensis, Rosa acicularis, Rubus pubescens, Sorbus decora,* and *Vaccinium myrtilloides*. The herbaceous stratum is sometimes dominated by *Aster macrophyllus*, but can include a diversity of forbs, such as *Anemone quinquifolia*, *Aralia nudicaulis, Clintonia borealis, Cornus canadensis, Galium triflorum, Maianthemum canadense, Mitella nuda, Pteridium aquilinum, Streptopus roseus*, *Trientalis borealis,* and *Viola renifolia*. Mosses include *Plagiomnium cuspidatum, Pleurozium schreberi, Ptilium crista-castrensis,* and *Rhytidiadelphus triquestris* (Sims *et al.* 1989, Chambers *et al.* 1997). Diagnostic features of this type are the dominance by both *Populus tremuloides* and *Betula papyrifera*, boreal conifer associates (but very little *Picea mariana* or *Pinus banksiana*), and lack of more southern hardwoods (such as *Acer saccharum*).

CONSERVATION RANK G5.

DATABASE CODE CEGL002466

COMMENTS

Voyageurs National Park

Diagnostic features of the type include the canopy of *Populus tremuloides, Betula papyrifera,* and/or *Populus grandidentata* with less than 25% cover by conifers. *Abies balsamea* present in the sub-canopy or shrub strata. Both dry and mesic versions of this type are common in the park. This type can resemble the Spruce-Fir-Aspen Forest but has < 25% spruce or fir in the canopy. The richer versions of this type, which generally occur on deeper soils, can grade into the Trembling Aspen-Balsam Poplar Lowland Forest. This occurs commonly in areas where there is less topographic relief and lacustrine clay is more common in the subsoil. Bedrock outcrops can also occur within stands of the Aspen-Birch-Boreal Conifer Forest. When the canopy is < 60% cover and canopy closure is prevented by the presence of bedrock outcrops, this type becomes the Mixed Aspen Rocky Woodland.

The Aspen-Birch-Red Maple Forest contains *Acer rubrum* in place of *Abies balsamea* in the sub canopy and shrub layers. The Aspen-Birch-Red Maple Forest, however, is very rare in the park. Where *Acer rubrum* and *Abies balsamea* occur mixed in the sub canopy and shrub layers, the stand is considered an Aspen-Birch-Boreal Conifer Forest.

Where the Aspen-Birch-Boreal Conifer Forest occurs adjacent to beaver ponds, beaver may cut many trees resulting in a very open canopy and, eventually, a Boreal Hazelnut-Serviceberry Rocky Shrubland community.

Globally

Historically, this type originated after catastrophic fires in boreal systems. Aspen can form suckers from the roots of

fire-killed trees, up to 30 m from the main stem, and has tiny, light seeds that can travel thousands of meters (Heinselman 1996). This type can cover extensive areas because of logging and repeated post-logging fires, which eliminated most of the local pine seed sources (MN NHP 1993). Locally, where this type occurs adjacent to beaver ponds, beaver may cut many trees resulting in a very open canopy and, eventually, a Boreal Hazelnut-Serviceberry Rocky Shrubland (CEGL005197) community (M. Smith personal communication 1999).

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